

Commonwealth of Kentucky
Division for Air Quality
PERMIT STATEMENT OF BASIS

(DRAFT)

Title V / Synthetic Minor, Construction

Permit: V-05-076

Celanese, Ltd.

Calvert City, KY 42029

March 16, 2007

Ralph Gosney, P.E., Reviewer

SOURCE ID: 21-157-00055

SOURCE A.I. #: 40292

ACTIVITY ID: APE20040001

SOURCE DESCRIPTION:

Celanese, Ltd.'s Calvert City operations are a synthetic organic chemical manufacturing industry (SOCMI). Celanese purchased the Calvert City Polyvinyl Alcohol plant from Air Products and Chemicals, Inc. on September 29, 2000. The source produces polyvinyl alcohol (PVOH) using vinyl acetate, methanol, sodium hydroxide, and a peroxide catalyst. Acetic acid is produced as a byproduct. The PVOH plant is divided into the following areas:

- i. Polymerization (Poly): Vinyl acetate monomer (VAM) is continuously polymerized to polyvinyl acetate (PVAc). The reaction uses methanol and organic peroxide.
- ii. Saponification (SAP): Following polymerization, the PVAc in methanol is hydrolyzed to dry polyvinyl alcohol (PVOH) using sodium hydroxide as a catalyst.
- iii. Polyrectification: VAM and methanol from the Polymerization area are separated to recover and recycle VAM and methanol.
- iv. Wedco: PVOH from the SAP Area is dry grinded into the final PVOH product.
- v. Acetic Acid Recovery (AAR): The mother liquor (mixture of methanol and methyl acetate) from the SAP area is processed to extract and recycle the methanol. Methyl acetate is converted to acetic acid and methanol in ion exchange beds. The methanol from this reaction is also recovered and recycled. The acetic acid is de-watered and sent out as final product.
- vi. Flare: The flare currently controls organic compound emissions from the Polyrectification and AAR Areas. The source plans to utilize the flare to control organic compound emissions from the Poly Area.
- vii. Tank Farm: The area consists of 26 tanks that hold the raw materials and intermediate process streams.
- viii. Loading Area: Materials are shipped and received by truck and railcar.

The potential to emit, as defined in 401 KAR 52:001, Section 1 (56) of volatile organic compounds (VOC), carbon monoxide (CO) and nitrogen oxides (NO_x) as regulated air pollutants is greater than one hundred (100) tons per year; and the potential to emit of single and combined hazardous air pollutants (HAPs) is greater than 10 and 25 tons per year, respectively. Therefore, the source is a major source and is subject to the provisions of 401 KAR 52:020. This is the initial Title V operating permit for this source. Air Products and Chemicals, Inc. submitted a skeleton Title V application on November 15, 1996, deemed complete by the Division on May 15, 1997. The Division received a revised Title V permit application from Celanese on September 30, 2002.

The following permits were issued to Air Products and Chemicals, Inc. for the PVOH plant. Conditions applicable to the Celanese plant equipment and operations are included in the Title V operating permit, as cited at Section B, Group Requirements.

Permit	Issue Date
S-97-054	May 20, 1997
S-95-103	May 30, 1995
O-87-015	March 27, 1987
C-85-186	September 17, 1985
C-83-194	December 9, 1983
S-95-198R	June 4, 1998
C-89-217R	November 22, 1993
C-86-172R	August 8, 1986
C-84-146	August 21, 1984

The following requests have been made by Celanese for the submittal of the Title V application. With the exception of the temporary plant trial application submitted July 1, 2004, these requests have been reviewed and are incorporated into the Title V permit, including the requirements pursuant to Significant Permit Revision No. VF-03-001.

Application Receipt Date	Application Description
03/30/06	Minor modification to comply with 40 CFR 63, Subpart FFFF
01/23/06	Minor modification to comply with 40 CFR 63, Subpart FFFF
09/29/05	Minor modification of EP W29, W37 and W38
06/17/05	Request for acceptance of compliance determination method for visible emissions
04/21/05	Modification of Insignificant Activity, EP M04
04/20/05	Modification of DEP7007N Form for EP S02 and additional operating scenario for EP T11
03/30/05	Replacement of application received 03/29/05
03/29/05	Minor modification of EP M04 and M05
12/29/04	Corrected emission estimation for EP F01, T02, T03 and T04
10/01/04	Minor modification of EP M04 and M05 during October 2004 outage
07/01/04	Temporary plant trial for minor modification for manufacture of a new polymer (Additive B) at EP P06 and P07 and temporary addition of a storage tank at EP P12
06/30/04	Minor modification to load methyl acetate at EP M11
06/02/04	Initial notification for 40 CFR 63, Subpart EEEE
01/27/04	Minor modification for manufacture of a new polymer (Additive A) at EP P06 and P07
05/02/03	Installation of two (2) bulk loading stations and modification of EP W33. This request was reviewed by the Division, and Significant Permit Revision No. VF-03-001 was issued on September 5, 2003.
02/2/03	Title V permit application additional information: DEP 7007CC form submittal

The following table provides a concise description of each significant emission unit at this source, along with revised KYEIS emission point identifiers for the listed emission units.

POLYMERIZATION PROCESS AREA

Old EP	New EP	Emission Point Description
EW, P01(--)	F01(11-)	Description: Polymerization 50 Line Reactors, Stripper and Auxiliary Equipment Control Device: Will vent to Flare, BA-5000 (see Section B, EP F01) on or before the compliance date in 40 CFR 63.2445(b) for compliance with 40 CFR 63, Subpart FFFF Maximum Processing Rate: 79,000 lb/hr Vent Condenser, HA-5050, will be replaced with vent to Flare, on or before the compliance date in 40 CFR 63.2445(b) for compliance with 40 CFR 63, Subpart FFFF
EW, P01(01)	11A	50 Line Polykettle Preheater, DA-5056; (F01(11A) product stream to F01(11B); exhaust to F01(11C))
EW, P01(02)	11B	50 Line Polykettle 5 (PK5), DC-5051; (F01(11B) product stream to F01(11D); exhaust to F01(11A))
EW, P01(03)	11C	50 Line PK5 Process Condenser, EA-5053; (F01(11C) product stream to F01(11B); exhaust to HA-5050, will exhaust to Flare (EP F01)) MON Group 1 Process Vent
EW, P01(04)	11D	50 Line Polykettle 6 (PK6), DC-5052; (F01(11D) product stream to F01(11F); exhaust to F01(11E))
EW, P01(05)	11E	50 Line PK6 Process Condenser, EA-5054; (F01(11E) product stream to F01(11D); exhaust to HA-5050, will exhaust to Flare (EP F01)) MON Group 1 Process Vent
EW, P01(06)	11F	50 Line Paste Stripper, DA-5051; (F01(11F) product stream to Tank Farm; exhaust to F01(11G))
EW, P01(07)	11G	50 Line Paste Stripper Condenser, EA-5056; (F01(11G) product stream to F01(11H); exhaust to HA-5050)
EW, P01(08)	11H	50 Line Paste Stripper Accumulator, FA-5052 (576 gallons); (F01(11H) product stream to F01(11A), F01(11F) or F01(10A); exhaust to HA-5050, will exhaust to Flare (EP F01)) MON Group 1 Process Vent
--	P01	Polymerization 50 Line Reactors, Stripper and Auxiliary Equipment Startups
EB(01), P03(--)	F01(12-)	Description: Polymerization 100 Line Reactors and Auxiliary Equipment Control Device: Will vent to Flare, BA-5000 (see Section B, EP F01) on or before the compliance date in 40 CFR 63.2445(b) for compliance with 40 CFR 63, Subpart FFFF Maximum Processing Rate: 79,000 lb/hr
EB(01), P03(01)	12A	100 Line Polykettle Preheater, DA-5106; (F01(12A) product stream to F01(12B); exhaust to F01(12C))
EB(01), P03(02)	12B	100 Line Polykettle 1 (PK1), DC-5101; (F01(12B) product stream to F01(12D); exhaust to F01(12A))
EB(01), P03(03)	12C	100 Line PK1 Process Condenser, EA-5103; (F01(12C) product stream to F01(12B); will exhaust to Flare (EP F01)) MON Group 1 Process Vent
EB(01), P03(04)	12D	100 Line Polykettle 2 (PK2), DC-5102; (F01(12D) product stream to F01(13A); exhaust to F01(12E))
EB(01), P03(05)	12E	100 Line PK2 Process Condenser, EA-5104; (F01(12E) product stream to F01(12D); will exhaust to Flare (EP F01)) MON Group 1 Process Vent
EC(01), P04(--)	F01(13-)	Description: Polymerization 100 Line Stripper and Auxiliary Equipment Control Device: Will vent to Flare, BA-5000 (see Section B, EP F01) on or before the compliance date in 40 CFR 63.2445(b) for compliance with 40 CFR 63, Subpart FFFF Maximum Processing Rate: 79,000 lb/hr
EC(01), P04(01)	13A	100 Line Paste Stripper, DA-5101; (F01(13A) product stream to Tank Farm; exhaust to F01(13B))
EC(01), P04(02)	13B	100 Line Paste Stripper Condenser, EA-5106; (F01(13B) product stream to F01(13C))

Old EP	New EP	Emission Point Description
EC(01), P04(03)	13C	100 Line Paste Stripper Accumulator, FA-5102 (576 gallons); (F01(13C) product stream to F01(12A), F01(13A) or F01(10A); will exhaust to Flare (EP F01)) MON Group 1 Process Vent
--	P03	Description: Polymerization 100 Line Reactors, Stripper and Auxiliary Equipment Startups
EB(02), P06(--)	F01(14-)	Description: Polymerization 150 Line Reactors and Auxiliary Equipment <u>Control Device:</u> Will vent to Flare, BA-5000 (see Section B, EP F01) on or before the compliance date in 40 CFR 63.2445(b) for compliance with 40 CFR 63, Subpart FFFF <u>Maximum Processing Rate:</u> 79,000 lb/hr
EB(02), P06(01)	14A	150 Line Polykettle Preheater, DA-5156;(F01(14A) product stream to F01(14B); exhaust to F01(14C))
EB(02), P06(02)	14B	150 Line Polykettle 3 (PK3), DC-5151; (F01(14B) product stream to F01(14D); exhaust to F01(14A))
EB(02), P06(03)	14C	150 Line PK3 Process Condenser, EA-5153;(F01(14C) product stream to F01(14B); will exhaust to Flare (EP F01)) MON Group 1 Process Vent
EB(02), P06(04)	14D	150 Line Polykettle 4 (PK4), DC-5152; (F01(14D) product stream to F01(15A); exhaust to F01(14E))
EB(02), P06(05)	14E	150 Line PK4 Process Condenser, EA-5154; (F01(14E) product stream to F01(14D); will exhaust to Flare (EP F01)) MON Group 1 Process Vent
EC(02), P07(--)	F01(15-)	Description: Polymerization 150 Line Stripper and Auxiliary Equipment <u>Control Device:</u> Will vent to Flare, BA-5000 (see Section B, EP F01) on or before the compliance date in 40 CFR 63.2445(b) for compliance with 40 CFR 63, Subpart FFFF <u>Maximum Processing Rate:</u> 79,000 lb/hr
EC(02), P07(01)	15A	150 Line Paste Stripper, DA-5151; (F01(15A) product stream to Tank Farm; exhaust to F01(15B))
EC(02), P07(02)	15B	150 Line Paste Stripper Condenser, EA-5156; (F01(15B) product stream to F01(15C))
EC(02), P07(03)	15C	150 Line Paste Stripper Accumulator, FA-5152 (576 gallons); (F01(15C) product stream to F01(14A), F01(15A) or F01(10A); will exhaust to Flare (EP F01)) MON Group 1 Process Vent
--	P06	Description: Polymerization 150 Line Reactors, Stripper and Auxiliary Equipment Startups
EY	P02	Description: 50 Line Catalyst Preparation Tanks (2), FA-5051A/B <u>Capacity:</u> 684 gallons each, storing a solution of 8 weight percent DEHA in methanol MON Group 2 Storage Tanks
EY	P05	Description: 100 Line Catalyst Preparation Tanks (2), FA-5101A/B <u>Capacity:</u> 272 gallons each, storing a solution of 8 weight percent DEHA in methanol MON Group 2 Storage Tanks
EP	P08	Description: 150 Line Catalyst Preparation Tanks (2), FA-5151A/B <u>Capacity:</u> 272 gallons each, storing a solution of 8 weight percent DEHA in methanol MON Group 2 Storage Tanks
--	P09	Description: Phosphoric Acid Tank, FA-5123 (500 gallons) MON Group 2 Storage Tank
--	P10(--)	Description: DEHA Preparation Tank and Charge Pots MON Group 2 Storage Tanks
	01	DEHA Preparation Tank, FA-5118 (200 gallons)
	02	DEHA Shortstop Charge Pots (2), HA-5063 and HA-5064 (110 gallons each)
	03	DEHA Shortstop Charge Pots (4), HA-5113, HA-5114, HA-5163 and HA-5164 (42 gallons each)
FV	P11	Description: Polymerization Process Unit Fugitives (Approximately 45 Pumps/Agitators, 12 Pressure Relief Valves, 1,295 Valves and 7,924 Connectors)

SAPONIFICATION (SAP) PROCESS AREA

Old EP	New EP	Emission Point Description
ED	S01(--)	Description: Saponification Process Unit, consisting of Four (4) Parallel Production Lines Control Device: Countercurrent, crossflow packed bed scrubber, identified as 600 SAP Vent Scrubber, DA-5602/DA-5604 Scrubbing Liquid: Water, methanol and methyl acetate Scrubbing Liquid Flow Rate: 35 gal/min Control Efficiency: 99% for Methyl Acetate and Methyl Alcohol 600 SAP Vent Scrubber, DA-5602/DA-5604, is a MON Recovery device and a MON Group 2 Process Vent
	S01(A-)	Description: Saponification 200 Line Process Maximum Processing Rate: 41,485 lb/hr
	A1	200 Line Paste Mixer, GD-5201 A/B
	A2	200 Line Belt Saponifier, DC-5201
	A3	200 Line Primary Crushing Mill (#1 PCM), PA-5201
	A4	200 Line Slurry Grinder (#2 PCM), PA-5202
	A5	200 Line Slurry Tank, FA-5201 (1,940 gallons) MON Surge Control Vessel
	A6	200 Line Centrifuge, JB-5201
	A7	200 Line Filtrate Tank, FA-5214 (415 gallons) MON Surge Control Vessel
	S01(B-)	Description: Saponification 250 Line Process Maximum Processing Rate: 41,485 lb/hr
	B1	250 Line Paste Mixer, GD-5251 A/B
	B2	250 Line Belt Saponifier, DC-5251
	B3	250 Line Primary Crushing Mill (#1 PCM), PA-5251
	B4	250 Line Slurry Grinder (#2 PCM), PA-5252
	B5	250 Line Slurry Tank, FA-5251 (1,940 gallons) MON Surge Control Vessel
	B6	250 Line Centrifuge, JB-5251
	B7	250 Line Filtrate Tank, FA-5254 (650 gallons) MON Surge Control Vessel
	S01(C-)	Description: Saponification 400 Line Process Maximum Processing Rate: 41,485 lb/hr
	C1	400 Line Paste Mixer, GD-5401 A/B
	C2	400 Line Belt Saponifier, DC-5401
	C3	400 Line Primary Crushing Mill (#1 Polymer Cutting Machine (PCM)), PA-5401
	C4	400 Line Slurry Grinder (#2 PCM), PA-5402
	C5	400 Line Slurry Tank, FA-5401 (1,940 gallons) MON Surge Control Vessel
	C6	400 Line Centrifuge, JB-5401
	C7	400 Line Filtrate Tank, FA-5404 (630 gallons) MON Surge Control Vessel
	S01(D-)	Description: Saponification 600 Line Process Maximum Processing Rate: 55,300 lb/hr
	D1	600 Line Paste Mixer, GD-5601 A/B
	D2	600 Line Belt Saponifier, DC-5601

Old EP	New EP	Emission Point Description
	D3	600 Line Primary Crushing Mill (#1 PCM), PA-5601
	D4	600 Line Slurry Grinder (#2 PCM), PA-5602
	D5	600 Line Slurry Tank, FA-5601 (1,940 gallons) MON Surge Control Vessel
	D6	600 Line Centrifuge, JB-5601
	D7	600 Line Filtrate Tank, FA-5604 (1,170 gallons) MON Surge Control Vessel
--	S01(E1) -(H1)	Saponification Process Tanks Tank Description: Fixed Roof Tanks MON Group 2 Storage Tanks
--	E1	Chilled Methanol Return Tank, FA-5203, storing methanol (250 gallons)
FU	F1	Sodium Hydroxide Feed Tank, FA-5211, storing a solution of 10 weight percent sodium hydroxide (4,210 gallons)
--	G1	Mixer Flush Tank, FA-5216, storing polyvinyl acetate and polyvinyl alcohol in methanol (2,200 gallons)
FU	H1	SAP Catalyst Make-up Tank, FA-5261, storing a solution of 10 weight percent sodium hydroxide (4,260 gallons)
FQ	S02(--)	Description: Saponification Process Unit Drying <u>Control Device:</u> Countercurrent packed bed scrubber, identified as Main Vent Scrubber, DA-5605 <u>Scrubbing Liquid:</u> Water, methanol and methyl acetate <u>Scrubbing Liquid Flow Rate:</u> 50 gal/min <u>Control Efficiency:</u> 82% for Methyl Acetate, 99% for Methyl Alcohol Main Vent Scrubber, DA-5605, is a MON Recovery device and a MON Group 2 Process Vent
	S02(A-)	Description: Saponification 200 Line Drying <u>Maximum Processing Rate:</u> 41,485 lb/hr
	A1	200 Line Turbo Dryer, PA-5202
	A2	200 Line Post Dryer, DA-5206
	A3	200 Line Cyclone Collector, FC-5201
	A4	200 Line Scrub Tower, DA-5201
	A5	200 Line Dryer Condensate Tank, FA-5202 (1,150 gallons) MON Surge Control Vessel
	S02(B-)	Description: Saponification 250 Line Drying <u>Maximum Processing Rate:</u> 41,485 lb/hr
	B1	250 Line Turbo Dryer, PA-5255
	B2	250 Line Post Dryer, DA-5256
	B3	250 Line Cyclone Collector, FC-5251
	B4	250 Line Scrub Tower, DA-5251
	B5	250 Line Dryer Condensate Tank, FA-5252 (1,350 gallons) MON Surge Control Vessel
	S02(C-)	Description: Saponification 400 Line Drying <u>Maximum Processing Rate:</u> 41,485 lb/hr
	C1	400 Line Turbo Dryer, PA-5405
	C2	400 Line Post Dryer, DA-5403
	C3	400 Line Cyclone Collector, FC-5401
	C4	400 Line Scrub Tower, DA-5401
	C5	400 Line Dryer Condensate Tank, FA-5402 (810 gallons) MON Surge Control Vessel

Old EP	New EP	Emission Point Description
	S02(D-)	Description: Saponification 600 Line Drying Maximum Processing Rate: 55,300 lb/hr
	D1	600 Line Turbo Dryer, PA-5605
	D2	600 Line Post Dryer, DA-5606
	D3	600 Line Cyclone Collector, FC-5601
	D4	600 Line Scrub Tower, DA-5603
	D5	600 Line Dryer Condensate Tank, FA-5602 (2,750 gallons) MON Surge Control Vessel
FR/FT	S03	200 Line Turbo Dryer Startups , PA-5202
EZ	S04	200 Line Product Transfer Collector , FD-5216 Description: Pneumatically transfers solids to the Pre-Grinded Product Silos Control Device: Baghouse, 99.6% control efficiency for PM
	S05	200 Line Boilout Emissions Boilout from Paste Mixer is a MON Group 2 Wastewater Stream Boilout from the Saponifier and Slurry Tank, Centrifuge and Filtrate Tank, Turbo Dryer, and Post Dryer are MON Maintenance Wastewater Streams
	S06	200/250 Saponification Lines Spot Vent Blower , GB-5215 Description: Captures 200/250 Line fugitive emissions
FR / FT	S07	250 Line Turbo Dryer Startups , PA-5255
EZ	S08	250 Line Product Transfer Collector , FD-5266 Description: Pneumatically transfers solids to the Pre-Grinded Product Silos Control Device: Baghouse, 99.6% control efficiency for PM
	S09	250 Line Boilout Emissions Boilout from Paste Mixer is a MON Group 2 Wastewater Stream Boilout from the Saponifier and Slurry Tank, Centrifuge and Filtrate Tank, Turbo Dryer, and Post Dryer are MON Maintenance Wastewater Streams
	S10	400 Line Spot Vent Blower , GB-5429 Description: Captures 400 Line fugitive emissions
FR / FT	S11	400 Line Turbo Dryer Startups , PA-5405
EZ	S12	400 Line Product Transfer Collector , FD-5416 Description: Pneumatically transfers solids to the Pre-Grinded Product Silos Control Device: Baghouse, 99.6% control efficiency for PM
	S13	400 Line Boilout Emissions Boilout from Paste Mixer is a MON Group 2 Wastewater Stream Boilout from the Saponifier and Slurry Tank, Centrifuge and Filtrate Tank, Turbo Dryer, and Post Dryer are MON Maintenance Wastewater Streams
	S14	600 Line Spot Vent , GB-5602 Description: Captures 600 Line fugitive emissions
FR / FT	S15	600 Line Turbo Dryer Startups , PA-5605
E0	S16	600 Line Product Transfer Collector , PA-5606 Description: Pneumatically transfers solids to the Pre-Grinded Product Silos Control Device: Baghouse 99.6% control efficiency for PM
	S17	600 Line Boilout Emissions Boilout from Paste Mixer is a MON Group 2 Wastewater Stream Boilout from the Saponifier and Slurry Tank, Centrifuge and Filtrate Tank, Turbo Dryer, and Post Dryer are MON Maintenance Wastewater Streams
FJ	S18	SAP Acid Tank , FA-5215, storing Acetic Acid (185 gallons) MON Group 2 Storage Tank
FV	S19	Saponification Process Unit Fugitives (Approximately 95 Pumps/Agitators, 60 Pressure Relief Valves, 2,002 Valves and 8,482 Connectors)

POLYRECTIFICATION AREA

Old EP	New EP	Emission Point Description
	F01(8-)	Description: Polymethanol Tower - Separates Vinyl Extraction Tower Bottoms to Methanol and Water <u>Maximum Processing Rate:</u> 75,000 lb/hr <u>Control Device:</u> Flare, BA-5000 (see Section B, EP F01)
	8A	Polymethanol Tower, DA-5103; (F01(8A) bottoms product stream to F01(10A), overheads to Condenser, EA-5109, to F01(8B)) MON Group 2 Wastewater Stream
	8B	Polymethanol Reflux Accumulator, FA-5120 (1,070 gallons); (F01(8B) product stream to F01(8A) or T05, exhaust to atmosphere) MON Group 1 Process Vent
	R01	Description: Polymethanol Tower Startups
	F01(9-)	Description: Vinyl Recovery Tower - Purifies Vinyl Extraction Tower Overheads <u>Maximum Processing Rate:</u> 55,420 lbs/hr <u>Control Device:</u> Flare, BA-5000 (EP F01)
EV(07)	9A	Vinyl Recovery Tower, DA-5104; (F01(9A) bottoms product stream to F01(9E), overheads to F01(9B) and F01(9C))
	9B	West Vinyl Recovery Condenser, EA-5111A; (F01(9B) product stream to F01(9D), exhaust to Control Device F01) MON Group 1 Process Vent
	9C	East Vinyl Recovery Condenser, EA-5108; (F01(9C) product stream to F01(9D), exhaust to Control Device F01) MON Group 1 Process Vent
	9D	Vinyl Recovery Tower Accumulator, FA-5107 (9,170 gallons); (F01(9D) product stream to F01(9F), exhaust to Control Device F01) MON Group 1 Process Vent, MON Group 1 Wastewater Stream
	9E	Vinyl Sludge Still, FA-5117
	9F	Vinyl Redistillation Tower, DA-5105; (F01(9F) product stream to F01(9G))
	9G	Redistillation Condenser, EA-5171; (F01(9G) product stream to T10)
	R02	Description: Vinyl Recovery Tower Startups
	F01(10-)	Description: Vinyl Extraction Tower - Separates Polymerization Unit Paste Stripper Accumulator Overheads to Vinyl Acetate and Methanol <u>Maximum Processing Rate:</u> 55,260 pounds/hour <u>Control Device:</u> Flare, BA-5000 (EP F01)
EV(12)	10A	Vinyl Extraction Tower, DA-5110; (F01(10A) bottoms product stream to F01(8A), overheads to F01(10D))
	10B	Vinyl Extraction Tower Condenser, EA-5170; (F01(10B) product stream to F01(10D))
	10D	Vinyl Extraction Tower Accumulator, FA-5104 (3,100 gallons); F01(10D) product stream to F01(9A), exhaust to Control Device F01) MON Group 1 Process Vent, MON Group 1 Wastewater Stream
	R03	Description: Vinyl Extraction Tower Startups
E4	R04	Inhibitor (BQ) Feed Tank, FA-5109 <u>Description:</u> Vinyl Acetate Storage Tank (265 gallons) <u>Maximum throughput:</u> 193,450 gallons/yr MON Group 2 Storage Tank
R03	R05	Polyrectification Process Unit Fugitives (Approximately 46 Pumps/Agitators, 16 Pressure Relief Valves, 456 Valves and 1,356 Connectors)

WEDCO AREA

Old EP	New EP	Emission Point Description
EE	W01(--)	Description: 200 Line Transfer and Grinding <u>Maximum Processing Rate:</u> 7,500 lb/hr <u>Control Device:</u> Main Baghouse, FD-5204, 99.6% control efficiency
	01	200 Line Transfer Cyclone, FC-5203
	02	200 Line Recycle Cyclone, FC-5205
E8	W02(01)	200 Line Intermediate Grinding/Sizing <u>Maximum Processing Rate:</u> 7,500 lb/hr <u>Control Device:</u> Screener Feeder Baghouse, FD-5207, 99.6% control efficiency
EE	W04(--)	Description: 250 Line Transfer and Grinding <u>Maximum Processing Rate:</u> 7,500 lb/hr <u>Control Device:</u> Main Baghouse, FD-5254, 99.6% control efficiency
	01	250 Line Transfer Cyclone, FC-5253
	02	250 Line Recycle Cyclone, FC-5255
E9	W05(01)	250 Line Intermediate Grinding/Sizing <u>Maximum Processing Rate:</u> 7,500 lb/hr <u>Control Device:</u> Screener Feeder Baghouse, FD-5257, 99.6% control efficiency
EE	W07(--)	Description: 400 Line Transfer and Grinding <u>Maximum Processing Rate:</u> 7,500 lb/hr <u>Control Device:</u> Main Baghouse, FD-5404, 99.6% control efficiency
	01	400 Line Transfer Cyclone, FC-5403
	02	400 Line Recycle Cyclone, FC-5405
FA	W08(01)	400 Line Intermediate Grinding/Sizing <u>Maximum Processing Rate:</u> 7,500 lb/hr <u>Control Device:</u> Screener Feeder Baghouse, FD-5407, 99.6% control efficiency
EX	W10(01)	600 Line Intermediate Grinding/Sizing <u>Maximum Processing Rate:</u> 10,000 lb/hr <u>Control Device:</u> 600 Line Transfer Baghouse, FD-5630, 99.6% control efficiency
EX	W11(01)	600 Line Intermediate Grinding/Sizing <u>Maximum Processing Rate:</u> 10,000 lb/hr <u>Control Device:</u> Recycle Baghouse, FD-5631, 99.6% control efficiency
EX	W12	600 Line Intermediate Grinding/Sizing <u>Maximum Processing Rate:</u> 10,000 lb/hr <u>Control Device:</u> Screener Feeder Baghouse, FD-5632, 99.6% control efficiency
EF	W14 - W19	Ground Silos #1, #2, #3, #4, #7 and #8 <u>Maximum Processing Rate:</u> 18,000 lb/hr each <u>Control Device:</u> Silo #1, #2, #3, #4, #7 and #8 Vent Filters, 99.6% control efficiency
	W14(01)	Ground Silo #1, FB-5701; <u>Control Device:</u> Silo #1 Vent Filter, FD-5704
	W15(01)	Ground Silo #2, FB-5702; <u>Control Device:</u> Silo #2 Vent Filter, FD-5705
	W16(01)	Ground Silo #3, FB-5703; <u>Control Device:</u> Silo #3 Vent Filter, FD-5706
	W17(01)	Ground Silo #4, FB-5704; <u>Control Device:</u> Silo #4 Vent Filter, FD-5707
	W18(01)	Ground Silo #7, FB-5707; <u>Control Device:</u> Silo #7 Vent Filter, FD-5708
	W19(01)	Ground Silo #8, FB-5708; <u>Control Device:</u> Silo #8 Vent Filter, FD-5709
	W20 - W25	Pre-Grinded Product Silos #9 - #14 <u>Description:</u> SAP Area product storage <u>Maximum Processing Rate:</u> 18,000 lb/hr each <u>Control Device:</u> Silo #9, #10, #11, #12, #13 and #14 Vent Filters, 99.6% control efficiency
	W20	Pre-Grinded Product Silo #9, FB-5709; <u>Control Device:</u> Silo #9 Vent Filter, FD-5710
	W21(01)	Pre-Grinded Product Silo #10, FB-5710; <u>Control Device:</u> Silo #10 Vent Filter, FD-5711
	W22(01)	Pre-Grinded Product Silo #11, FB-5711; <u>Control Device:</u> Silo #11 Vent Filter, FD-5712
	W23(01)	Pre-Grinded Product Silo #12, FB-5712; <u>Control Device:</u> Silo #12 Vent Filter, FD-5713

Old EP	New EP	Emission Point Description
	W24(01)	Pre-Grinded Product Silo #13, FB-5713; <u>Control Device</u> : Silo #13 Vent Filter, FD-5714
	W25(01)	Pre-Grinded Product Silo #14, FB-5714; <u>Control Device</u> : Silo #14 Vent Filter, FD-5715
EY	W26 - W28	Description: Ground Silos #15 - #17 <u>Maximum Processing Rate</u> : 18,000 lb/hr each <u>Control Device</u> : Silo #15, #16 and #17 Pulse Jet Bin Vent Filters, 99.6% control efficiency
	W26(01)	Ground Silo #15, FB-5715; <u>Control Device</u> : Silo #15 Pulse Jet Bin Vent Filter, FD-5739
	W27(01)	Ground Silo #16, FB-5716; <u>Control Device</u> : Silo #16 Pulse Jet Bin Vent Filter, FD-5740
	W28(01)	Ground Silo #17, FB-5717; <u>Control Device</u> : Silo #17 Pulse Jet Bin Vent Filter, FD-5741
059, EH(85)	W29(01)	PVOH Bulk Loading - Railcar <u>Maximum Processing Rate</u> : 36,000 lb/hr <u>Control Device</u> : Bulk Loading Baghouse, FD-5716, 99.6% control efficiency
	W30(01)	PVOH Bulk Unloading <u>Maximum Processing Rate</u> : 7,200 lb/hr <u>Control Device</u> : Bulk Unloading Baghouse, FD-5718, 99.6% control efficiency
	W32	Bulk Loading/Unloading Fugitives <u>Maximum Processing Rate</u> : 3,548 lb/hr
063	W33(01)	Bagging Operation: Filling - Sackmatic, PA-5716 <u>Description</u> : Filling Operation <u>Maximum Processing Rate</u> : 900 lb/hr <u>Control Device</u> : Bagging Machine Dust Baghouse, FE-5713A, 99.6% control efficiency
064	W34(01)	Bagging Hopper, FB-5723 <u>Description</u> : Filling Operation <u>Maximum Processing Rate</u> : 30,000 lb/hr <u>Control Device</u> : Bagging Hopper Dust Collector, FD-5759, 99.6% control efficiency
	W36	Bagging Area Fugitives <u>Maximum Processing Rate</u> : 30,000 lb/hr
	W37 - W38	Description: Bulk Truck Loading Stations <u>Maximum Processing Rate</u> : 100,000 lb/hr total <u>Control Device</u> : 40" Trailer Mounted Filter Canister, 99.6% control efficiency for PM
067	W37	North Bulk Truck Loading Station <u>Description</u> : Loading from Silos #1 and #4 and the bagging hopper <u>Maximum Processing Rate</u> : 100,000 lb/hr
068	W38	South Bulk Truck Loading Station <u>Description</u> : Loading from Silos #15-17 <u>Maximum Processing Rate</u> : 100,000 lb/hr

ACETIC ACID RECOVERY (AAR) AREA

Old EP	New EP	Emission Point Description
EV(13)	F01(2-)	Description: East Methyl Acetate (MeAc) Extraction Tower - Separates Mother Liquor from the SAP Unit to Methyl Acetate and Methanol <u>Maximum Processing Rate:</u> 53,000 lb/hr <u>Control Device:</u> Flare, BA-5000 (EP F01)
	2A	East MeAc Extraction Tower, DA-5300 HON Group 1 Process Vent, HON Maintenance Wastewater Stream, HON Group 2 Wastewater Stream
	2B	East MeAc Extraction Tower Condenser, EA-5301 HON Group 1 process vent, HON Group 2 Wastewater Stream
	2C	East MeAc Extraction Tower Vent Condenser, EA-5341 HON Group 1 Process Vent
	2D	East MeAc Extraction Tower Reflux Accumulator, FA-5331 (2,538 gal) HON Bottoms Receiver
	A01	Description: East Methyl Acetate (MeAc) Extraction Tower Startups
	F01(3-)	Description: West Methyl Acetate (MeAc) Extraction Tower - Separates Mother Liquor from the SAP Unit to Methyl Acetate and Methanol <u>Maximum Processing Rate:</u> 85,000 lb/hr <u>Control Device:</u> Flare, BA-5000 (EP F01)
EV(10)	3A	West MeAc Extraction Tower, DA-5304 HON Group 1 Process Vent, HON Maintenance Wastewater Stream, HON Group 2 Wastewater Stream
	3B	West MeAc Extraction Tower Condenser, EA-5313 HON Group 1 Process Vent
	3C	West MeAc Extraction Tower Vent Condenser, EA-5339 HON Group 1 Process Vent
EV(11)	3D	West MeAc Extraction Tower Reflux Drum, FA-5309 (5,299 gallons) HON Bottoms Receiver
	A02	Description: West Methyl Acetate (MeAc) Extraction Tower Startups
	F01(4-)	Description: Aldehyde Tower - Processes MeAc Towers' Overheads (MeAc) <u>Maximum Processing Rate:</u> 120,000 lb/hr <u>Control Device:</u> Flare, BA-5000 (EP F01)
EV(08)	4A	Aldehyde Tower, DA-5302 HON Group 1 Process Vent, HON Maintenance Wastewater Stream, HON Group 2 Wastewater Stream
	4B	Aldehyde Tower Condenser, EA-5308 HON Group 1 Process Vent
FS	4C	Aldehyde Tower Reflux Drum, FA-5311 (1,018 gallons) HON Bottoms Receiver
	A03	Description: Aldehyde Tower Startups
	F01(5-)	Description: SAP Methanol Tower - Separates MeAc Towers' Bottoms to Methanol and Water <u>Maximum Processing Rate:</u> 100,000 lb/hr <u>Control Device:</u> Flare, BA-5000 (EP F01)
EV(09)	5A	SAP Methanol Tower, DA-5303 HON Group 1 Process Vent, HON Maintenance Wastewater Stream, HON Group 2 Wastewater Stream
	5B	Methanol Reboiler, EA-5309A HON Group 1 Process Vent, HON Group 2 Wastewater Stream
		Methanol Reflux Drum, FA-5312 (9,000 gallons) HON Surge Control Vessel
	A04	Description: SAP Methanol Tower Startups

Old EP	New EP	Emission Point Description
	F01(6-)	Description: Crude Acid Tower - Processes Ion Exchange Reactors' Product Stream <u>Maximum Processing Rate:</u> 100,000 lb/hr <u>Control Device:</u> Flare, BA-5000 (EP F01)
	6A	Crude Acid Tower, DA-5308 HON Group 1 Process Vent, HON Maintenance Wastewater Stream, HON Group 2 Wastewater Stream
	6B	Crude Acid Condenser, EA-5328 HON Surge Control Vessel
FH	6C	Crude Acid Tower Reflux Accumulator, FA-5325 (1,183 gal) HON Bottoms Receiver
	F01(6-)	Description: Three (3) Ion Exchange Reactors - Processes Aldehyde Tower Bottoms to Methanol and Acetic Acid HON Group 1 Process Vent, HON Group 2 Wastewater Stream
	6D	Ion Exchange Reactor, FA-5306A HON Group 1 Process Vent, HON Group 2 Wastewater Stream
	6E	Ion Exchange Reactor, FA-5306B HON Group 1 Process Vent, HON Group 2 Wastewater Stream
	6F	Ion Exchange Reactor, FA-5306E HON Group 1 Process Vent, HON Group 2 Wastewater Stream
	A05	Description: Three (3) Ion Exchange Reactors and Crude Acid Tower Startups
	F01(7-)	Description: Product Acid Tower - Processes Crude Tower Bottoms to Acetic Acid <u>Maximum Processing Rate:</u> 31,600 lb/hr <u>Control Device:</u> Flare, BA-5000 (EP F01)
	7A	Product Acid Tower, DA-5309 HON Group 1 Process Vent, HON Maintenance Wastewater Stream, HON Group 2 Wastewater Stream
	7B	Product Acid Tower Condenser, EA-5332 HON Group 1 Process Vent
FG	7C	Product Acid Reflux Drum, FA-5328 (1,648 gallons) HON Bottoms Receiver
	7D	Sludge Still, FA-5319 HON Bottoms Receiver
	A06	Description: Product Acid Tower Startups
E3	A07	Dilute Acid Tank Condenser, EA-5340
E3	A07(01)	Dilute Acid Tank, FA-5330 (10,000 gallons) <u>Maximum Throughput:</u> 200,000 gallons/yr
ER	A08	Acetic Acid Rundown Tanks (3) <u>Capacity:</u> FA-5322A - 3,000 gal, FA-5322B - 10,000 gal, FA-5322C - 10,000 gal <u>Maximum Throughput:</u> 31,536,000 gallons/yr (total)
0EV(03)-(06)	A09	AAR Process Unit Fugitives (Approximately 49 Pumps/Agitators, 53 Pressure Relief Valves, 1,975 Valves and 6,237 Connectors)

FLARE

Old EP	New EP	Emission Point Description
EV(01)	F01	Flare, BA-5000 Description: The flare is used to control hydrocarbon streams from EP F01(2A-2D, 4A-4C, 7A-7D, 10A, 10B, 10D). To comply with 40 CFR 63 Subpart FFFF, the flare will be used to control EP F01(11), F01(12), F01(13), F01(14), F01(15), F01(16), F01(17), F01(18) and F01(19). Manufacturer: John Zinc Model: EEF-QS-10 Utility Unassisted Flare Control Efficiency: 98.0% (VOC and organic HAPs) HON and MON Group 1 Process Vent, Group 2 Process Wastewater Stream
-	F01(1A)	AAR Knockout Pot Control Device: Flare, BA-5000 (EP F01) HON Surge Control Vessel
-	F01(1B)	Flare Knockout Drum Control Device: Flare, BA-5000 (EP F01) HON Surge Control Vessel

TANK FARM

Old EP	New EP	Emission Point Description
	T01, T09	Methyl Acetate/Methanol Storage Tanks (110,000 gallons each) Tank Description: Internal Floating Roof Tanks with primary seal (vapor-mounted) and secondary seal (rim-mounted) Maximum Throughput: 22,000,000 gallons/yr each HON Group 1 Storage Vessels
EA	T01	Methyl Acetate/Methanol Storage Tank, FB-1513
E1	T09	Methyl Acetate/Methanol Storage Tank, FB-5538
EM, T02-T03	F01(16) - F01(17)	Paste Storage Tanks Nests #1 and #2 (51,000 gallons each) Tank Description: Fixed Roof Tanks for receipt of paste from the Polymerization Area and for feed for SAP Area Control Device: Vapor Balancing (varying control efficiency); will vent to Flare, BA-5000 (see Section B, EP F01) on or before the compliance date in 40 CFR 63.2445(b) for compliance with 40 CFR 63, Subpart FFFF Maximum throughput: 60,000,000 gallons/yr as methanol each MON Group 1 Storage Tanks
EM(01), T02	F01(16 A-16D)	Paste Storage Tanks North Nest #1 (4), FB-5501, FB-5502, FB-5503 and FB-5504
EM(02), T03	F01(17 A-17D)	Paste Storage Tanks South Nest #2 (4), FB-5505, FB-5506, FB-5507 and FB-5508
E2(01)-(02), T04	F01(18 A-18B)	Paste Storage Tanks West Nest #3 (2) , FB-5509 and FB-5510 Tank Description: Fixed Roof Tanks (78,800 gallons each) Control Device: Venturi Scrubber, FH-5550, 95% control efficiency; will vent to Flare, BA-5000 (see Section B, EP F01) on or before the compliance date in 40 CFR 63.2445(b) for compliance with 40 CFR 63, Subpart FFFF Maximum throughput: 60,000,000 gallons/yr as methanol total MON Group 1 Storage Tanks
EK	T05	Methanol Storage Tank , FB-5531 (51,000 gallons) Tank Description: Internal Floating Roof Tank with primary seal (Vapor-mounted) and secondary seal (Rim-mounted) storing “fresh” methanol (95%) and recovered methanol (5%) from the Polymethanol Tower, DA-5103 Maximum throughput: 3,120,000 gallons/yr MON Group 1 Storage Tanks

Old EP	New EP	Emission Point Description
EL	T06	Methanol Saponification Tank System (4) , FB-5532, FB-5533, FB-5534 and FB-5535 <u>Tank Description</u> : Internal Floating Roof Tanks with primary seal (Vapor-mounted) primarily storing recovered methanol from the SAP Methanol Tower (DA-5303) and the Polymethanol Tower (DA-5103) and also storing Mother Liquor <u>Tank Capacity</u> : 51,000 gallons each <u>Maximum Throughput</u> : 134,028,000 gallons/yr (total) HON Group 1 Storage Vessels
	T07-T08	Mother Liquor Storage Tanks (215,000 gallons each) <u>Tank Description</u> : Internal Floating Roof Tank with Primary Seal (Vapor-mounted) and Secondary Seal (Rim-mounted) <u>Maximum Throughput</u> : 138,809,600 gallons/yr each HON Group 1 Storage Vessels
EI	T07	N. Mother Liquor Storage Tank, FB-5536
EJ	T08	S. Mother Liquor Storage Tank, FB-5537
ES, T10	F01(19 A-19C)	Recovered Vinyl Acetate Rework Storage Tanks (3), FB-5521, FB-5522 and FB-5523 <u>Capacity</u> : 14,800 gallons each <u>Control Device</u> : Will vent to Flare, BA-5000 (see Section B, EP F01) on or before the compliance date in 40 CFR 63.2445(b) for compliance with 40 CFR 63, Subpart FFFF <u>Operating Scenario #1</u> : Fixed roof tanks storing recovered vinyl acetate from the Vinyl Redistillation Tower (DA-5105); <u>Maximum throughput</u> : 39,420,000 gallons/yr total <u>Operating Scenario #2</u> : Fixed roof tanks storing stripper overheads (primarily vinyl acetate) from the Vinyl Extraction Tower (DA-5104) during outages; <u>Maximum throughput</u> : 355,200 gallons/yr total MON Group 1 Storage Tanks
EN	T11	Acetic Acid Tanks (4) <u>Tank Description</u> : Fixed Roof Tanks (FB-1501 - 71,000 gal, FB-1502 - 110,000 gal, FB-1503 - 204,000 gal, FB-1517/FB-4517 - 450,000 gal) <u>Operating Scenario #1</u> : Acetic Acid Storage; <u>Maximum Throughput</u> : 31,536,000 gallons/yr <u>Operating Scenario #2</u> : Methyl Acetate storage in FB-1517/FB-4517; <u>Maximum Throughput</u> : 2,250,000 gallons/yr in FB-1517/FB-4517
	T14	Tank Farm Fugitives (Approximately 23 Pumps/Agitators, 36 Pressure Relief Valves, 537 Valves and 4,155 Connectors)
	M11	Off-Spec/Rework Pollution Control Trailer , No. 2284 <u>Description</u> : Splash loading from the processes <u>Tank Capacity</u> : 6,000 gallons <u>Tank ID 104</u> : 390,000 gallons/yr Acetic Acid <u>Tank ID 105</u> : 60,000 gallons/yr Mother Liquor <u>Tank ID 106</u> : 30,000 gallons/yr Vinyl Acetate <u>Tank ID 108</u> : 120,000 gallons/yr Methyl Acetate MON Group 2 Storage Tank

LOADING AREA

Old EP	New EP	Emission Point Description
FK	M04	Acetic Acid Loading Area – Railcar <u>Operating Scenario #1</u> : 15,000 gal/hr Acetic Acid (131,400,000 gal/year) <u>Operating Scenario #2</u> : 15,000 gal/hr Methyl Acetate (131,400,000 gal/year) <u>Control Device</u> : Vapor recovery system, 75% control efficiency HON Group 2 Transfer Rack

Old EP	New EP	Emission Point Description
FK	M05	Acetic Acid Loading Area – Tank Truck <u>Operating Scenario #1</u> : 4,050 gal/hr Acetic Acid (35,478,000 gal/year) <u>Operating Scenario #2</u> : 4,050 gal/hr Methyl Acetate (35,478,000 gal/year) HON Group 2 Transfer Rack
	M06	Methanol Unloading Area – Railcar <u>Maximum Transfer Rate</u> : 2,964,000 gallons/year MON Group 2 Transfer Rack
--	M12	Loading Area Fugitives (Approximately 4 Pumps, 85 Valves and 300 Connectors)

COOLING TOWERS

EP	Emission Point Description
--	Non-Contact Process Cooling Tower (1), CT-7 <u>Description</u> : Provides cooling water to AAR Area HON Heat Exchange System
--	Non-Contact Process Cooling Towers (2), CT-2 and CT-6 <u>Description</u> : Provide cooling water to the SAP Area MON Heat Exchange System

WAREHOUSE FUGITIVES

Old EP	New EP	Emission Point Description
FP	M10	Warehouse Fugitives

COMMENTS:

(1) Type of control and efficiency

Several control devices are used at the plant:

- (a) Process condensers in the Poly Area are used to recover chemicals for reuse, but also provide incidental control for the process equipment (reactors and strippers) in this area.
- (b) Process equipment (reactors and strippers) in the AAR and Polyrectification Areas is controlled by a flare (98% efficiency). The permittee will vent the process equipment (EP F01(11A)-F01(11H), F01(12A)-F01(12E), F01(13A)-F01(13C), F01(14A)-F01(14E) and F01(15A)-F01(15C) in the Polymerization Area to the flare (EP F01) to comply with 40 CFR 63 Subpart FFFF on or before the rule compliance date specified in 40 CFR 63.2445(b).
- (c) The Saponification equipment in the SAP Area is controlled by a scrubber at EP S01 (with a 99% efficiency for Methyl Acetate and Methyl Alcohol, to comply with 40 CFR 63 Subpart FFFF on or before the rule compliance date specified in 40 CFR 63.2445(b)). The drying equipment in the SAP Area is controlled by a scrubber at EP S02 (with a 82% efficiency for Methyl Acetate and a 99% efficiency for Methyl Alcohol, to comply with 40 CFR 63 Subpart FFFF on or before the rule compliance date specified in 40 CFR 63.2445(b)).
- (d) The PVOH transfer, grinding, storage and loading operations in the WEDCO Area and the Loading Area are controlled by filters and baghouses (all having a 99.6%

efficiency).

- (e) The North and South Paste Tank Farm Nests (EP F01(16A)-F01(16D) and F01(17A)- F01(17D)) are currently controlled by vapor balancing (varying efficiency) and the West Paste Tank Farm Nest (EP F01(18A)-F01(18B)) is currently controlled by a venturi scrubber (95% efficiency). To comply with 40 CFR 63 Subpart FFFF on or before the rule compliance date specified in 40 CFR 63.2445(b), the permittee will replace the control devices for these tanks with a closed vent system venting to the flare (EP F01) and vent the emissions from EP F01(19A)-F01(19C) to the flare (EP F01).

(2) **Emission factors and their source**

Emissions were estimated using a combination of AP-42 emission factors and engineering estimates, as provided by the permittee. Potential VOC and HAPs emissions from the storage tanks were calculated using U.S. EPA TANKS program, with results provided by the permittee. Fugitive emissions from leaking equipment components were based on USEPA Protocol for Equipment Leak Estimates, EPA 453/R-95-017, November 1995, Tables 2-1 and 2-5) and weight fraction. Flare emissions were based on AP-42. Railcar and Tank Truck Loading were based on AP-42 Chapter 5.2 and engineering estimates. See the detailed emission calculations in the Pollutants of Concern (POC) tables.

(3) **Applicable Regulations**

- (a) 401 KAR 59:010, *New Process Operations*, applies to each affected facility not subject to another emission standard for particulate matter (PM) in Chapter 59 of 401 KAR commenced on or after July 2, 1975. This rule applies to EP S04, S08, S12, S16, W01, W02, W04, W05, W07, W08, W10, W11, W12 and W14-W30, W33, W34, W37 and W38. Visible emissions shall not exceed 20% opacity. Emissions of PM shall not exceed the following:

Emission Point	Allowable Emission Rate
S04, S08 and S12	7.09 lb/hr
S16	8.48 lb/hr
W01, W02, W04, W05, W07, W08	8.15 lb/hr, each
W10-W12	9.74 lb/hr, each
W14-W28	14.02 lb/hr, each
W29	21.55 lb/hr
W30	7.94 lb/hr
W33	2.34 lb/hr, each
W34	19.24 lb/hr
W37, W38	32.37 lb/hr, each

- (b) 401 KAR 59:050, *New Storage Vessels for Petroleum Liquids*, applies to storage vessels for petroleum liquids with a storage capacity greater than 580 gallons but less than 10,567 gallons commenced on or after July 24, 1984, which is part of a major source of volatile organic compounds. This rule applies to the 3,000 gallon underground gasoline storage tank at EP M08, which shall be equipped with a permanent submerged fill pipe. No other vessels at this source store petroleum liquids.

- (c) 401 KAR 63:002, Sections 2 and 3(1)(a), which incorporates by reference 40 CFR 63 Subpart A, *General Provisions*, applies to the Flare (EP F01) as incorporated by reference in 40 CFR 63, Subparts G and FFFF.
- (d) 401 KAR 63:002, Sections 2 and 3(1)(d), which incorporates by reference 40 CFR 63 Subpart F, *National Emission Standards for Organic Hazardous Air Pollutants From the Synthetic Organic Chemical Manufacturing Industry*, applies to the AAR Area units. This rule applies to the maintenance wastewater streams in the AAR Area from EP F01(2A), F01(3A), F01(4A), F01(5A), F01(6A), and F01(7A) and the cooling tower CT-7. This rule is applicable to the Saponification Area, pursuant to 40 CFR 63, Subpart FFFF, and applies to maintenance wastewater and liquid streams in an open system within a Miscellaneous Organic Chemical Manufacturing Process Unit (MCPU). This rule is also applicable to the cooling towers CT-2 and CT-6, pursuant to 40 CFR 63, Subpart FFFF. The related rule requirements, including emission limitations, monitoring, record keeping and reporting, are incorporated into the permit.
- (e) 401 KAR 63:002, Sections 2 and 3(1)(e), which incorporates by reference 40 CFR 63 Subpart G, *National Emission Standards for Organic Hazardous Air Pollutants from the Synthetic Organic Chemical Manufacturing Industry for Process Vents, Storage Vessels, Transfer Operations, and Wastewater*, applies to the AAR Area units. This rule applies to the Group 1 process vents at EP F01(2A), F01(2B), F01(2C), F01(3A), F01(3B), F01(3C), F01(4A), F01(4B), F01(5A), F01(5B), F01(6A), F01(6D), F01(6E), F01(6F), F01(7A) and F01(7B); the process wastewater streams from EP F01(2A), F01(2B), F01(3A), F01(4A), F01(5A), F01(5B), F01(6A), F01(6D), F01(6E), F01(6F) and F01(7A); the flare for the AAR Area Group 1 process vents; the Group 1 storage vessels at EP T01, T06-T09 and T11; and the transfer operations at EP M04 and M05. This rule is applicable to the Saponification Area units and the Polyrectification Area units pursuant to 40 CFR 63, Subpart FFFF, and applies to the process wastewater streams. The related rule requirements, including emission limitations, monitoring, record keeping and reporting, are incorporated into the permit.
- (f) 401 KAR 63:002, Sections 2 and 3(1)(f), which incorporates by reference 40 CFR 63 Subpart H, *National Emission Standards for Organic Hazardous Air Pollutants for Equipment Leaks*, applies to the associated pipeline equipment from the AAR Area units at EP A09; the pipeline equipment from the AAR Area unit storage vessels from EP T14; the pipeline equipment from the transfer operations at EP M04 and M05; the surge control vessels at EP F01(1A), F01(1B), F01(6B), and the SAP Methanol Tower Methanol Reflux Drum, FA-5312; the bottoms receivers at EP F01(2D), F01(3D), F01(4C), F01(6C), F01(7C) and F01(7D); and the closed vent systems routing vapors to the flare. This rule is applicable pursuant to 40 CFR 63, Subpart FFFF, and applies to the equipment leaks in the Polymerization, Saponification Area and Polyrectification Area units and the pipeline equipment from the affected storage vessels at EP T14. The related rule requirements, including emission limitations, monitoring, record keeping and reporting, are incorporated into the permit.

- (g) 401 KAR 63:002, Sections 2 and 3(1)(kk), which incorporates by reference 40 CFR 63 Subpart SS, *National Emission Standards for Closed Vent Systems, Control Devices, Recovery Devices and Routing to a Fuel Gas System or a Process*, is applicable pursuant to 40 CFR 63, Subpart FFFF, and applies to the closed vent systems routing vapors to a control device and to the flare for the Polymerization, Polyrectification and Tank Farm Areas and the closed vent systems in the Saponification Area. The related rule requirements, including emission limitations, monitoring, record keeping and reporting, are incorporated into the permit.
- (h) 401 KAR 63:002, Sections 2 and 3(1)(oo), which incorporates by reference 40 CFR 63 Subpart WW, *National Emission Standards for Storage Vessels (Tanks) – Control Level 2*, is applicable pursuant to 40 CFR 63, Subpart FFFF, and applies to the storage tank at EP T05.
- (i) 401 KAR 63:002, Sections 2 and 3(1)(mmm), which incorporates by reference 40 CFR 63 Subpart FFFF, *National Emission Standards for Hazardous Air Pollutants: Miscellaneous Organic Chemical Manufacturing*, applies to the Polymerization, Saponification, and Polyrectification Areas, as these areas produce polyvinyl alcohol, listed under table 1 of 40 CFR 63 Subpart B, *Requirements for Control Technology Determinations for Major Sources in Accordance with Clean Air Act Sections, Sections 112(g) and 112(j)*, as a MON Source Category. The permittee shall comply with the provisions of 40 CFR Part 63, Subpart FFFF no later than the compliance date specified in 40 CFR 63.2445(b). The related rule requirements, including emission limitations, monitoring, record keeping and reporting, are incorporated into the permit. The following summarizes the affected emission points:
 - (i) 40 CFR 63.2455 applies to EP F01(11A)-F01(11H), F01(12C), F01(12E), F01(13C), F01(14C), F01(14E), F01(15C), F01(8B), F01(9B), F01(9C) and F01(9D), each as a Group 1 continuous process vent pursuant to 40 CFR 63.2455(b), and EP S01 and S02, each as a Group 2 continuous process vent pursuant to 40 CFR 63.2455(c), and incorporates by reference the standards in 40 CFR 63, Subpart SS.
 - (ii) 40 CFR 63.2470 applies to the Group 1 storage tanks at EP F01(16A)-F01(18B), T05 and F01(19A)-F01(19C), and incorporates by reference the standards in 40 CFR 63, Subpart WW for tanks with internal floating roofs. 40 CFR 63.2470 also applies to the Group 2 storage tanks at EP P02, P05, P08, P09, P10, S01(E1)-S01(H1), S18, R04 and M11. The Group 1 storage tanks shall be equipped with an internal floating roof or vent through a closed vent system to the flare.
 - (iii) Celanese plans to vent the emissions from EP F01(16A)-F01(18B) and F01(19A)-F01(19C) to a closed vent system to the flare by the MON compliance date. EP T05 is equipped with an internal floating roof.
 - (iv) 40 CFR 63.2475 applies to the transfer rack at EP M06 and incorporates by reference the standards in 40 CFR 63, Subpart G.
 - (v) 40 CFR 63.2480 applies to the equipment leaks and incorporates by reference the standards in 40 CFR 63, Subpart H.
 - (vi) 40 CFR 63.2485 applies to the wastewater streams from EP S05, S09, S13 S17, F01(8A), F01(9D) and F01(10D) and the liquid streams in open systems

- from EP S01. For the maintenance wastewater streams, 40 CFR 63.2485 incorporates by reference the standards in 40 CFR 63, Subpart F. For the process wastewater streams, 40 CFR 63.2485 incorporates by reference the standards in 40 CFR 63, Subpart G. For the Group 1 wastewater stream from EP F01(9D), the permittee has elected to transfer this stream to an off-site treatment operation, pursuant to the requirements of 40 CFR 63.132(g). For the liquid streams in open systems, 40 CFR 63.2485(a) incorporates by reference the standards in 40 CFR 63, Subpart G.
- (vii) 40 CFR 63.2490 applies to the cooling towers CT-2 and CT-6 and incorporates by reference the standards in 40 CFR 63, Subpart F.
- (j) 401 KAR 63:010, *Fugitive Emissions*, applies to sources of fugitive emissions not elsewhere subject to an opacity standard. This rule applies to EP W32, W36 and M10.
- (k) 401 KAR 63:015, *Flares*, applies to the opacity of the flare. Visible emissions from the flare shall not exceed 20 percent opacity for more than three minutes in any one day.
- (l) 401 KAR 63:020, *Potentially Hazardous Matter or Toxic Substances*, applies to sources which emit or may emit potentially hazardous or toxic substances, in the Polymerization, Saponification, Polyrectification, WEDCO, Tank Farm and Loading Areas and EP M10. If the source alters process rates, material formulations, or any other factor that would result in an increase of HAP emissions or the addition of HAP emissions not previously evaluated by the Division, the source shall submit the appropriate application forms pursuant to 401 KAR 52:020, along with air modeling to show that the facility will remain in compliance with 401 KAR 63:020. The source may perform a screening analysis of the potential to emit of methanol, methyl acetate, phosphoric acid, or any other toxic pollutant emissions at the plant and compare it to established benchmarks (i.e. Reference Concentrations (RfCs), Unit Risk Estimates (UREs), as applicable).
- (m) 401 KAR 60:005, Sections 2 and 3(1)(q), which incorporates by reference 40 CFR 60, Subpart Kb (40 CFR 60.112b), *Standards of Performance for Volatile Organic Liquid Storage Vessels (Including Petroleum Liquid Storage Vessels) for Which Construction, Reconstruction, or Modification Commenced after July 23, 1984*, is applicable to EP F01(18A)-F01(18B), which shall be equipped with a control device designed to reduce inlet VOC emissions by 95 percent or greater. Pursuant to 40 CFR 63.2535(c), by the compliance date of 40 CFR 63 Subpart FFFF, these emissions will be routed to the flare and the permittee must comply with the monitoring, recordkeeping, and reporting requirements in Subpart FFFF.
- (n) 40 CFR 60, Subpart VV (40 CFR 60.480), *Standards of Performance for Equipment Leaks of VOC in the Synthetic Organic Chemicals Manufacturing Industry*, is applicable to the Polyrectification Area units, as these units produce vinyl acetate, which is listed under §60.489, as an intermediate. However, the facility may elect to comply with 40 CFR 63 Subpart FFFF instead of 40 CFR 60 Subpart VV after the compliance date of Subpart FFFF, pursuant to 40 CFR 63.2535(k).

- (c) 40 CFR 60, Subpart NNN, *Standards of Performance for Volatile Organic Compound (VOC) Emissions From Synthetic Organic Chemical Manufacturing Industry (SOCMI) Distillation Operations*, is applicable to the Polyrectification Area units, as these units produce vinyl acetate, which is listed under §60.667, as an intermediate. However, the facility may elect to comply with 40 CFR 63 Subpart FFFF instead of 40 CFR 60 Subpart NNN after the compliance date of Subpart FFFF, pursuant to 40 CFR 63.2535(h).
- (4) **Non-Applicable Regulations**
 - (a) 401 KAR 60:005, Sections 2 and 3(1)(q), which incorporates by reference 40 CFR 60, Subpart Kb (40 CFR 60.112b), *Standards of Performance for Volatile Organic Liquid Storage Vessels (Including Petroleum Liquid Storage Vessels) for Which Construction, Reconstruction, or Modification Commenced after July 23, 1984*, does not apply to the storage tanks at EP P02, P05, P08, P10, P12, S01(D5), S01(D7), S02(D5), R04 and F01(19A)-F01(19C) because the storage capacity of each tank is less than the rule applicability threshold of 75 m³ (19,812 gallons), and does not apply to P09 because phosphoric acid is not a VOL. Excluding F01(18A) and F01(18B), all other storage tanks were commenced before July 23, 1984, and there are no modification or reconstruction approvals for these tanks.
 - (b) 40 CFR 60, Subpart VV (40 CFR 60.480), *Standards of Performance for Equipment Leaks of VOC in the Synthetic Organic Chemicals Manufacturing Industry*, is not applicable to the Saponification Area units, as these units do not produce chemicals listed under §60.489. The facility is not required to comply with 40 CFR 60 Subpart VV for the AAR Area units, since 40 CFR 63 Subpart H is applicable to those units, pursuant to 40 CFR 63.160(b)(1).
 - (c) 40 CFR 60, Subpart NNN, *Standards of Performance for Volatile Organic Compound (VOC) Emissions From Synthetic Organic Chemical Manufacturing Industry (SOCMI) Distillation Operations*, is not applicable to the Polymerization Area units, as these units do not produce chemicals listed under §60.667. This rule is not applicable to the Polyrectification Area because chemical recovery is exempt from this regulation since the distillation operation, which is used to recover and purify a listed feedstock chemical, vinyl acetate, for reuse in the same distillation process unit to produce a non-listed chemical, polyvinyl acetate. This rule is not applicable to the AAR Area units, pursuant to 40 CFR 63.110(d)(4), Subpart G.
 - (d) 40 CFR 60, Subpart RRR, *Standards of Performance for Volatile Organic Compound Emissions from Synthetic Organic Chemical Manufacturing Industry (SOCMI) Reactor Processes*, is not applicable to the Polymerization Area units or the Saponification Area units, as these units do not produce chemicals listed under §60.707. This rule is not applicable to the AAR Area units, pursuant to 40 CFR 63.110(d)(7), Subpart G.
 - (e) 401 KAR 63:002, Sections 2 and 3(1)(d), which incorporates by reference 40 CFR 63 Subpart F, *National Emission Standards for Organic Hazardous Air Pollutants from the Synthetic Organic Chemical Manufacturing Industry*, and related Subparts G and H, are not applicable to the Polymerization, Saponification, Polyrectification

or WEDCO Area units; or the cooling towers CT-2 and CT-6, as these units do not produce chemicals listed under table 1 of 40 CFR 63, Subpart F as a primary product. This regulation does not apply to the storage tanks at EP T11 as these tanks do not store HAPs listed in Table 2 of 40 CFR 63 Subpart F.

- (f) 401 KAR 63:002, Sections 2 and 3(1)(e), which incorporates by reference 40 CFR 63 Subpart G, *National Emission Standards for Organic Hazardous Air Pollutants from the Synthetic Organic Chemical Manufacturing Industry for Process Vents, Storage Vessels, Transfer Operations, and Wastewater*, is not applicable to the storage tanks at EP F01(16-)-F01(18-), T05 or F01(19-); or the transfer racks at EP M06 or M11, as these units are not part of a chemical manufacturing processing unit that produces chemicals listed under table 1 of 40 CFR 63, Subpart F as a primary product.
- (g) 401 KAR 63:002, Sections 2 and 3(1)(f), which incorporates by reference 40 CFR 63, Subpart H, *National Emission Standards for Organic Hazardous Air Pollutants for Equipment Leaks*, is not applicable to the equipment leaks from the storage tanks at EP F01(16A)-F01(18B), T05 or F01(19A)-F01(19C); or the equipment leaks from the transfer racks at EP M06 or M11, as these units are not part of a chemical manufacturing processing unit that produces chemicals listed under table 1 of 40 CFR 63, Subpart F as a primary product.
- (h) 401 KAR 63:002, Sections 2 and 3(1)(m), which incorporates by reference 40 CFR 63 Subpart Q, *National Emission Standards for Hazardous Air Pollutants for Industrial Process Cooling Towers*, is not applicable to the cooling towers CT-2, CT-6 or CT-7 since chromium based water treatment chemicals are not used.
- (i) 401 KAR 63:002, Sections 2 and 3(1)(lll), which incorporates by reference 40 CFR 63 Subpart EEEE, *National Emission Standards for Hazardous Air Pollutants: Organic Liquids Distribution (Non-Gasoline)*, does not apply to the organic liquid distribution of methanol and vinyl acetate, listed under table 1 of 40 CFR 63 Subpart EEEE, in the Polymerization, Saponification or Polyrectification Area units; the storage tanks at EP F01(16A)-F01(18B), T05, F01(19A)-F01(19C) or M11; or the transfer rack at EP M06, because these operations are subject to 40 CFR 63, Subpart FFFF. This rule does not apply to the organic liquid distribution of methanol, listed under table 1 of 40 CFR 63 Subpart EEEE, for the AAR Area units; the storage tanks at EP T01, T06-T09 and T11; or the transfer racks at M04 or M05, because these operations are subject to 40 CFR 63, Subparts F, G and H.
- (j) 40 CFR 63, Subpart FFFF, *National Emission Standards for Hazardous Air Pollutants: Miscellaneous Organic Chemical Manufacturing*, is not applicable to the WEDCO Area units because solid material grinding and storage is not part of a MON process, pursuant to 40 CFR 63.2550 (Definitions).
- (k) 401 KAR 63:020, *Potential hazardous matter or toxic substances*, is applicable to a facility that emits or may potentially emit hazardous or toxic substances provided such emissions are not elsewhere subject to the provisions of the administrative regulations of the Division. Since this source is subject to other provisions, i.e., 40 CFR 63, Subparts F, G, H and FFFF, the requirements of this rule for facility

emissions of organic HAP compounds are not applicable to the emission units in the Polymerization, SAP, Polyrectification or AAR Areas that are controlled due to 40 CFR 63, Subparts F, G, H or FFFF.

- (l) 40 CFR 64, *Compliance Assurance Monitoring (CAM)*, does not apply to this source as this is a first issue Title V permit.
- (m) Pursuant to the definition of *Storage tank* and *Surge control vessel* in 40 CFR 63.2550, surge control vessels are excluded from the definition of a storage tank. Therefore, the SAP Slurry Tanks (EP S01(A5), S01(B5), S01(C5) and S01(D5)), the SAP Filtrate Tanks (EP S01(A7), S01(B7), S01(C7) and S01(D7)) and the Dryer Condensate Tanks (S02(A5), S02(B5), S02(C5) and S02(D5)) are exempt from 40 CFR 63 Subpart FFFF.

EMISSION AND OPERATING CAPS DESCRIPTION:

This source has elected to accept the following annual limits in order to preclude the applicability of 401 KAR 51:017, *Prevention of Significant Deterioration of Air Quality* (PSD) for volatile organic compounds (VOC) and for particulate matter (PM):

- (a) The total emissions of volatile organic compounds (VOC) from the summation of emissions from EP F01(11-), F01(12-), F01(13-), F01(14-), F01(15-), P02, P05, P08, S01, S02, W01, W04, W07, W14-W25, W29, F01(2A), F01(3A), F01(5A), F01(9A), F01(10A), A07, A08, R04, F01(18-), T05, T06, T07, T08, T09, F01(19-) and T11 shall not exceed 248 tons per consecutive twelve (12) month period. [Permit No. S-95-198R, issued on June 4, 1998, Permit No. S-97-054, issued on May 20, 1997, Permit No. C-86-172, issued on August 8, 1986, and Permit No. C-84-146, issued on August 21, 1984]
- (b) The total VOC emissions from EP S01 and S02 shall not exceed 37.67 tons per consecutive twelve (12) month period. [Permit No. O-87-015, Condition 18, issued on March 27, 1987]
- (c) The total emissions of particulate matter (PM) from the summation of emissions from EP W01, W04, W07, W11, W14-W25, W26-W28, S04, S08, S12 and S16 shall not exceed 27 tons per consecutive twelve (12) month period. [Permit No. C-84-146 issued on August 21, 1984]

The permittee shall also comply with the following operating limitations.

- (a) The loading rates of polyvinyl alcohol (PVOH) shall not exceed the following limitations: [VF-03-001, issued on September 5, 2003]
 - i. EP W29: 75,000 tons per twelve (12) consecutive month basis
 - ii. EP W33: 5,000 tons per twelve (12) consecutive month basis
 - iii. EP W34: 63,022 tons per twelve (12) consecutive month basis
 - iv. EP W37: 75,000 tons per twelve (12) consecutive month basis
 - v. EP W38: 75,000 tons per twelve (12) consecutive month basis
- (b) The production rates shall not exceed the following limitations: [Permit No. S-95-198R, issued on June 4, 1998 and Permit No. C-86-172, issued on August 8, 1986]
 - i. F01(3A): 85,000 lbs/hr and 372,300 tons per twelve (12) consecutive month basis
 - ii. F01(9A): 55,420 lbs/hr and 242,748 tons per twelve (12) consecutive month basis
 - iii. F01(10A): 55,260 lbs/hr and 242,039 tons per twelve (12) consecutive month basis
- (c) The production rates shall not exceed the following limitations, determined on a twelve (12)

consecutive month basis: [Permit No. S-95-198R, issued on June 4, 1998]

- i. F01(2A): 53,000 lbs/hr
- ii. F01(4A): 120,000 lbs/hr
- iii. F01(5A): 100,000 lbs/hr
- iv. F01(7A): 31,600 lbs/hr

PERIODIC MONITORING:

To preclude the applicability of 401 KAR 51:017, *Prevention of Significant Deterioration of Air Quality* (PSD) for VOC and PM, this source has elected to accept annual limits. The permit contains monthly production rate limitations and requires the source to monitor and keep monthly records of production rates and storage tank throughputs for the affected units. The permit also requires monitoring and recordkeeping of control device operating parameters and preventive maintenance. The permit requires these records to be reported semiannually.

For the affected units venting to particulate control devices, the pressure drop across each particulate control device shall be monitored and recorded continuously. For the Polymerization Lines, the pressure, vent valve position and inlet coolant temperature of each polykettle process condenser shall be monitored and recorded continuously. For the scrubbers at EP S01 and S02, the scrubbing liquid flow rate and temperature shall be monitored and recorded continuously. All records shall be reported semiannually.

Monitoring for the flare (EP F01) shall continue to be performed in accordance with 40 CFR 63, Subpart G and 40 CFR 63.11, which includes continuously detecting the presence of a pilot flame. Monthly VOC equipment leak checks are required for system components in each production area, and the methods shall continue to follow 40 CFR 63, Subpart H.

OPERATIONAL FLEXIBILITY:

For the occurrences of start-ups at EP P01, P03, P06, S02(A1), S02(B1), S02(C1), S02(D1), R01, R02 or R03, the permittee shall follow the Startup, Shutdown, and Malfunction Plan requirements of 40 CFR 63 Subparts A and FFFF.

For the occurrences of start-ups at EP A01, A02, A03, A04, A05 or A06, the permittee shall follow the Startup, Shutdown, and Malfunction Plan requirements of 40 CFR 63 Subparts A, F, G and H.

For the pipeline equipment in the Polymerization, Polyrectification, SAP, Tank Farm, and Loading Areas, subject to 40 CFR 63.2480(a) and Table 6 to Subpart FFFF, the permittee may comply with the requirements in Subpart UU of 40 CFR 63 and the requirements referenced therein, except as specified in §63.2480(b) and (d); Subpart H of 40 CFR 63 and the requirements referenced therein, except as specified in §63.2480(b) and (d); or 40 CFR 65, subpart F and the requirements referenced therein, except as specified in §63.2480(c) and (d).

CREDIBLE EVIDENCE:

This permit contains provisions which require that specific test methods, monitoring or recordkeeping be used as a demonstration of compliance with permit limits. On February 24, 1997, the U.S. EPA promulgated revisions to the following federal regulations: 40 CFR Part 51, Sec.

51.212; 40 CFR Part 52, Sec. 52.12; 40 CFR Part 52, Sec. 52.30; 40 CFR Part 60, Sec. 60.11 and 40 CFR Part 61, Sec. 61.12, that allow the use of credible evidence to establish compliance with applicable requirements. At the issuance of this permit, Kentucky has only adopted the provisions of 40 CFR Part 60, Sec. 60.11 and 40 CFR Part 61, Sec. 61.12 into its air quality regulations.